

CLAIMS

What is claimed is:

- 5 1. A hinge assembly for coupling a sliding door of a vehicle to a drive unit for sliding the sliding door from an open position to a closed position, the drive unit causing the hinge assembly to slide within a guide track as the door moves between the open position and the closed position, the hinge assembly comprising:
- 10 a first hinge portion;
 a second hinge portion, said first hinge portion being pivotally secured to said second hinge portion;
 a cable attachment being secured to said second hinge portion;
 and
- 15 a guide surface disposed on a surface of said first hinge portion, said guide surface being configured to make contact with a portion of a cable having an end secured to said cable attachment when said second hinge portion is in a first orientation with respect to said first hinge portion position and said cable no longer makes contact with said guide surface as said second hinge
- 20 portion moves from said first orientation to a second orientation with respect to said first hinge portion.
- 25 2. The hinge assembly as in claim 1, wherein said cable attachment moves closer to said first hinge assembly as said second hinge portion moves from said first orientation to said second orientation.
- 30 3. The hinge assembly as in claim 1, wherein said first hinge portion is pivotally secured to said second hinge portion by a pivot pin.
4. The hinge assembly as in claim 1, wherein said first hinge portion further comprises a plurality of rollers for being slidably received within the guide track.

5. The hinge assembly as in claim 1, wherein the other end of said cable is coupled to the drive unit and said cable attachment is coupled to the sliding door and said first orientation of said second hinge portion corresponds to the open door position and said second orientation of said second hinge portion corresponds to the closed door position.

6. The hinge assembly as in claim 5, wherein movement of said second hinge portion from said first orientation to said second orientation is caused by said first hinge portion traveling in a curved portion of the guide track.

7. The hinge assembly as in claim 1, wherein the guide track is a center guide track and said cable attachment is secured to a rear portion of the sliding door.

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8. A drive assembly for a sliding door, comprising:
a guide track having a curved portion disposed at one end;
a hinge assembly comprising: a first hinge portion, a second hinge portion, said first hinge portion being pivotally secured to said second hinge portion; a cable attachment being secured to said second hinge portion; and a guide surface disposed on a surface of said first hinge portion, said guide surface being configured to make contact with a portion of a first cable having an end secured to said cable attachment when said second hinge portion is in a first orientation with respect to said first hinge portion position and said portion of said first cable no longer makes contact with said guide surface as said second hinge portion moves from said first orientation to a second orientation with respect to said first hinge portion;

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25 a second cable secured to said first hinge portion at one end; and
a drive unit for providing a tension to said first cable to cause said first hinge portion to travel within said guide track in a first direction and for providing a tension to said second cable to cause said first hinge portion to travel within said guide track in a second direction;

wherein said second hinge portion moves from said first orientation to a second orientation as said first hinge portion travels in said curved portion of said guide track.

9. The drive assembly as in claim 8, wherein said drive unit further comprises a cable drum, wherein said first cable and said second cable are each secured to said cable drum and said cable drum is rotated by a motor of said drive unit, wherein rotation of said cable drum causes said first hinge portion to travel in said guide track as one of said cables wraps onto said cable drum while the other one of said cables wraps off of said cable drum.

10. The drive assembly as in claim 9, wherein said cable drum is capable of freely rotating when said motor of said drive unit is not rotating said cable drum.

11. The drive assembly as in claim 8, wherein said curved portion of said guide track corresponds to a portion of a periphery of a door opening in a vehicle.

12. The drive assembly as in claim 8, wherein said guide track is configured to provide a lower track of the sliding door.

13. The drive assembly as in claim 8, wherein said guide track is configured to provide a center track of the sliding door.

14. The drive assembly as in claim 8, wherein said drive unit further comprises an electromagnetic clutch for coupling and decoupling said motor to said cable drum.

15. A drive assembly for a sliding door of a vehicle, comprising:
a guide track having a curved portion disposed at one end;
a hinge assembly, comprising: a first hinge portion, a second

hinge portion, said first hinge portion being pivotally secured to said second hinge portion; a cable attachment being secured to said second hinge portion; and a guide surface disposed on a surface of said first hinge portion, said guide surface being configured to make contact with a portion of a first cable having
5 an end secured to said cable attachment when said second hinge portion is in a first orientation with respect to said first hinge portion position and said portion of said first cable no longer makes contact with said guide surface as said second hinge portion moves from said first orientation to a second orientation with respect to said first hinge portion;

10 a second cable secured to said first hinge portion at one end;
a drive unit for providing a tension to said first cable to cause said first hinge portion to travel within said guide track in a first direction and for providing a tension to said second cable to cause said first hinge portion to travel within said guide track in a second direction;

wherein said second hinge portion moves from said first orientation to a second orientation as said first hinge portion travels in said curved portion of said guide track; and

a pulley disposed on said curved portion of said guide track, wherein a portion of said first cable is directly aligned with said end of said first cable secured to said cable attachment when said first cable no longer makes contact with said guide portion.

16. The drive assembly as in claim 15, wherein said guide track is a center guide track.

17. A method for providing a closing force to a sliding door of a vehicle, comprising:

securing one end of a cable to the sliding door;
securing another end of said cable to the motor drive unit for providing a pulling force to said cable; and
pivotally securing a first hinge portion to a second hinge portion, said second hinge portion being secured to the sliding door and said first hinge

portion being slidably received within a guide track having a curved portion;

wherein said cable makes contact with a guide member of said first hinge portion when said first hinge portion is not traveling within said curved portion and wherein a direct force is applied to a portion of the sliding door when said first hinge portion is traveling in said curved portion and said cable no longer makes contact with said guide member.

18. The method as in claim 17, wherein said portion of the sliding door is a rear portion of the sliding door.

19. The method as in claim 17, further comprising:

securing one end of another cable to said first hinge portion and securing another end of said another cable to the motor drive unit for providing a pulling force to said another cable, said pulling force to said another cable being opposite in direction to the pulling force applied to said cable.

20. The method as in claim 17, wherein the sliding door is aligned with a door opening in the vehicle when said cable no longer makes contact with said guide portion.

21. The method as in claim 17, further comprising:

positioning a pulley at an end of said guide track having said curved portion, said pulley being located to align a portion of said cable with a point of securement of said end of said cable to the door.

22. A method for closing a sliding door of a vehicle, comprising:

aligning the door with a door opening of the vehicle;
directly providing a pulling force to a rear portion of the door by a cable that is aligned with a surface of a pulley and said rear portion of the door, wherein said pulling force causes the door to travel inward into the door opening.

23. The method as in claim 22, wherein said pulling force is applied when a latching mechanism of the door is in a secondary latching position and said pulling force causes said latching mechanism to translate into primary latching position wherein the door is fully received within the door opening.

24. The method as in claim 23, wherein said pulling force is applied by a motor drive unit of a center guide track.

25. The method as in claim 22, wherein said pulling force is applied by a motor drive unit of a center guide track.

26. The method as in claim 22, wherein said pulling force is applied when a latching mechanism of the door is in a primary latching position wherein the door is fully received within the door opening.

27. The method as in claim 26, wherein said pulling force is applied by a motor drive unit of a center guide track.

28. A drive assembly for a sliding door of a vehicle, comprising:
a guide track having a curved portion disposed at one end;
a hinge assembly, comprising: a first hinge portion, a second hinge portion, said first hinge portion being pivotally secured to said second hinge portion; a cable attachment being secured to the sliding door and said second hinge portion being integral with the sliding door; and a guide surface
5 disposed on a surface of said first hinge portion, said guide surface being configured to make contact with a portion of a first cable having an end secured to said cable attachment when said second hinge portion is in a first orientation with respect to said first hinge portion position and said portion of said first cable no longer makes contact with said guide surface as said second hinge
10 portion moves from said first orientation to a second orientation with respect to said first hinge portion;
a second cable secured to said first hinge portion at one end;

a drive unit for providing a tension to said first cable to cause said first hinge portion to travel within said guide track in a first direction and for providing a tension to said second cable to cause said first hinge portion to travel within said guide track in a second direction;

wherein said second hinge portion moves from said first orientation to a second orientation as said first hinge portion travels in said curved portion of said guide track; and

a pulley disposed on said curved portion of said guide track, wherein a portion of said first cable is directly aligned with said end of said first cable secured to said cable attachment when said first cable no longer makes contact with said guide portion.